

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1 (canceled).

Claim 2 (currently amended). The method according to claim 1, which claim 37,  
which comprises:

using, as the system for ~~one of~~ testing ~~and simulating~~ the integrated circuit, an automatic test equipment (ATE); and

applying the set of test patterns to the integrated circuit via the automatic test equipment.

Claim 3 (original). The method according to claim 2, which comprises implementing the neural network in the automatic test equipment.

Claim 4 (currently amended). The method according to claim 1, which claim 37,  
which comprises generating the set of test patterns on a random basis.

Claim 5 (currently amended). The method according to claim 1, wherein claim 37,  
wherein step (d) includes adapting inter-unit weights of the neural network through back-propagation.

Claim 6 (currently amended). The method according to claim 1, which claim 37,  
which comprises repeating steps (a) to (d) until a level of adaptation in step (d) falls  
below a given value.

Claim 7 (original). The method according to claim 5, which comprises storing data  
representing predetermined neural network parameters after terminating a repetition  
of steps (a) to (d).

Claim 8-19 (canceled).

Claim 20-22 (canceled).

Claim 23 (currently amended). The method according to claim 22, which claim 37,  
which comprising repeating steps (B) to (E) until the given test criteria are met.

Claim 24 (currently amended). The method according to claim 22, which claim 37,  
which comprises repeating steps (B) to (E) until a condition is met, the condition  
being selected from the group consisting of meeting the given test criteria and  
repeating steps (B) to (E) a given number of times.

Claim 25 (currently amended). The method according to claim 1, which claim 37,  
which comprises concluding that the given test criteria are met if the set of test  
patterns is associated with an average fitness above a given value.

Claim 26 (currently amended). The method according to claim 1, wherein claim 37,

wherein step (E) includes combining at least some of the test patterns according to the genetic algorithm in order to provide the new set of test patterns.

Claim 27 (original). The method according to claim 26, which further comprises:

selecting test patterns from the set of test patterns according to given selection criteria in order to provide selected test patterns; and

combining the selected test patterns according to the genetic algorithm to provide the new set of test patterns.

Claim 28 (original). The method according to claim 27, which comprises selecting a test pattern if the test pattern is associated with a fitness value greater than a reference value.

Claim 29 (original). The method according to claim 27, which comprises selecting a test pattern if the test pattern is associated with a highest fitness value of all unselected test patterns.

Claim 30 (original). The method according to claim 27, which comprises selecting a test pattern if the test pattern is associated with a highest fitness value of all unselected test patterns, and repeating the selecting step until a given percentage of test patterns has been selected.

Claim 31 (original). The method according to claim 29, wherein step (E) includes:

(F) sorting selected test patterns according to an order of associated fitness values;

(G) randomly selecting parent test patterns from test patterns as sorted in step (F);

and

(H) combining selected ones of the parent test patterns.

Claim 32 (currently amended). The method according to claim 1, which claim 37,  
which comprises using at least one element selected from the group consisting a  
mutation, a crossing over, and a re-combination for the genetic algorithm.

Claim 33 (currently amended). The method according to claim 1, wherein claim 37,  
wherein the step (A) includes providing a plurality of sets of test patterns such that  
each of the sets of test patterns is included in a test pattern population.

Claim 34 (currently amended). The method according to claim 1, which claim 37,  
which comprises providing a plurality of test pattern populations and performing  
steps (B) to (E) for each of the test pattern populations.

Claim 35-36 (canceled).

Claim 37 (new). A method of testing an integrated circuit, the method which  
comprises:

adapting a neural network to approximate a behavior of the integrated circuit, by:

- (a) applying a set of test patterns to the integrated circuit;
  - (b) applying the set of test patterns to the neural network;
  - (c) comparing outputs of the integrated circuit and outputs of the neural network to form a comparison result; and
  - (d) adapting parameters of the neural network to approximate the behavior of the integrated circuit on a basis of the comparison result;
- subsequently applying further test patterns to the neural network thus adapted; processing an output of the neural network to determine whether predetermined criteria are met;
- selecting those further test patterns that meet the predetermined criteria;
- (A) providing a set of test patterns consisting of the selected test patterns;
  - (B) applying the set of selected test patterns to the integrated circuit using automatic test equipment (ATE);
  - (C) determining the outputs of the integrated circuit;
  - (D) processing the outputs to determine whether predetermined test criteria are met;
- and

(E) depending on a determination in step (D), generating a new set of test patterns based on the set of selected test patterns provided in step (A) using a genetic algorithm; and

using the new set of test patterns to test the integrated circuit.

Claim 38 (new). A computer-readable medium having computer-executable instructions that, when executed, cause a computer to perform a method which comprises the steps of:

adapting a neural network to approximate a behavior of the integrated circuit , by:

(a) applying a set of test patterns to the integrated circuit;

(b) applying the set of test patterns to the neural network;

(c) comparing outputs of the integrated circuit and outputs of the neural network to form a comparison result; and

(d) adapting parameters of the neural network to approximate the behavior of the integrated circuit on a basis of the comparison result;

subsequently applying further test patterns to the neural network thus adapted;

processing an output of the neural network to determine whether predetermined criteria are met;

selecting those further test patterns that meet the predetermined criteria;

- (A) providing a set of test patterns consisting of the selected test patterns;
  - (B) applying the set of selected test patterns to the integrated circuit using automatic test equipment (ATE);
  - (C) determining the outputs of the integrated circuit;
  - (D) processing the outputs to determine whether predetermined test criteria are met;  
and
  - (E) depending on a determination in step (D), generating a new set of test patterns based on the set of selected test patterns provided in step (A) using a genetic algorithm; and
- using the new set of test patterns to test the integrated circuit.